

**Remarks**

This response is to the Final Office Action dated January 15, 2009.

Claims 1, 5-6, 28-37, 41-44, 46-51, 53, 55, 57, 59-62 and 68-72 are pending. Claims 1, 50 and 61 are amended. Support for these amendments can be found throughout the specification, for example on page 9, lines 8-14 of the specification as filed. Claims 52, 62 and 64-67 have been canceled.

This response also reflects the remarks made during the telephonic interview with the Examiner on June 23, 2009.

**Claim Rejection based on 112, first paragraph**

In the Office Action at page 3, claims 52, 64, 67 and 72 are rejected under Section 112 as allegedly unsupported by the specification. The Applicant respectfully disagrees. However, solely to expedite prosecution, Applicant has cancelled claims 52, 64, and 67, while retaining claim 72.

In each case, the claim states a specific value, while the specification states a range of values that encompasses this claimed value. Claims 52, 64, and 67 all claim use of 1000mg of calcium, while the specification describes use of a range of 773 mg to 1346 mg of calcium. Claim 72 claims consumption of 2000 to

2500 kcal per day, while the specification describes consumption of a range of 200 to 2500 kcal per day.

The Examiner states that a specification that details a range of values, does not lend support to a single value within that range. The Examiner cites MPEP 2163.05 to support this proposition. The Examiner is apparently referring to Section III, entitled Range Limitations. MPEP 2163.05 Section III states that if a specification cites a range, such as "25 to 60%," the specification will support the smaller, inclusive range "35 to 60%," but not the range "greater than 35%." The reason is that "greater than 35%" encompasses values outside the specification range of 25 to 60% (e.g., 100%), and thus is not supported by the specification. The section cites *In re Wertheim* which states the same interpretation. 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

In the case of claim 72, the comparison to *In re Wertheim* is apt. Just as in *Wertheim*, claim 72 claims a smaller range, 2000 to 2500 kcal per day and is supported by the larger, but inclusive, range of 200 to 2500 kcal per day. Thus claim 72 is clearly supported by the specification, and in just the manner that *In re Wertheim* and MPEP 2163.05 state.

**Claim Rejection Based on 103(a)**

In the Office Action at page 6, claims 1, 5-6, 28-30, 32, 41-44, 46-53, 55, 57, 59-62, and 64-71 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over *Study: Calcium May Curb Weight Gain in Young Women*, <http://www.sciencedaily.com/releases/19991014199042107.htm>, April 21 1999; and Summerbell, et al, *Randomized Controlled Trial of Novel, Simple and Well Supervised Weight Reducing Diet in Outpatients*, *BMJ* 1998, 317: 1487-9. The Applicant disagrees. The claims recite novel features that the Science Daily article lacks and the Summerbell article does not supply.

The pending claims recite a method of inducing weight loss comprising, in combination, administering a therapeutically effective amount of calcium in the amended range of about 745 mg to about 1459 mg, and reducing caloric intake below ad lib to a range of more than 1900 to about 2500 kcal per day. The Science Daily article purports to teach that consumption of calcium in the amount of 1000 mg resulted in weight loss for women who consumed less than 1900 kcal per day, and found no benefit for calorie intakes above 1900. The Science Daily article reported "[t]here appears to be some sort of interaction with higher-calorie diets," Teegarden says. "When we looked at the data for the women with calorie intakes of more than 1,900, we found that

the calories take over, and any potential benefits of weight-control from calcium are lost.'" Science Daily, paragraph 11. The Science Daily numbers are significantly different than the numbers in the pending claims. Unlike the claimed methods, the Science Daily article states that calcium consumption has no effect in patients whose calorie consumption exceeds 1900 kcal per day. Yet, the claimed methods provide a measurable reduction of weight in diets in the range of more than 1900 to about 2500 kcal per day, as long as the individual's calorie consumption is below ad lib. Thus the claimed methods will continue to provide benefit at calorie intakes that exceed those stated in Science Daily by, e.g., 20%. This result directly contradicts the Science Daily article. Any person skilled in the art upon reading Science Daily would conclude that there is no benefit to the administration of calcium at caloric intakes greater than 1900 kcal per day, contrary to the claimed methods. Accordingly, Science Daily does not disclose or suggest the claimed methods.

Furthermore, a person of ordinary skill in the art upon reading Science Daily would not draw any conclusions from its purported teachings. A reference "must be evaluated for what [it] fairly teach[es] one of ordinary skill in the art." In re Inland Steel Co., 60 USPQ.2d 1396, 1401 (Fed. Cir. 2001)

(internal citations omitted). A person of ordinary skill in the relevant art would not consider a sensational headline in a news article to constitute a "teaching" with any scientific validity. And a person of ordinary skill would not consider the purported "findings" to "fairly teach" anything of significance to a person of ordinary skill. Indeed, the lead researcher herself invites the reader to withhold judgment until "these findings are confirmed." In addition, several statements made in the article are of questionable scientific validity, such that a person of ordinary skill in the art would have waited until the data were published before lending any credence to them.

In Science Daily, the reported "findings" are acknowledged to be preliminary, and the lead researcher effectively cautions against drawing any conclusions from the preliminary findings until the findings are confirmed. In paragraph 14, Dr. Teegarden, the lead researcher on the study, notes that "if these findings are confirmed," then action based on the findings may be warranted. Thus, the lead researcher herself acknowledges that the reference, on its own, does not provide any basis for drawing any actionable conclusions related to calcium and weight loss. Accordingly, Science Daily does not "fairly teach" anything of value to a person of ordinary skill, but in fact invites the readers of the article to wait until the

results are confirmed, presumably in a peer-reviewed, published article, before drawing any conclusions.

Also, several of the statements in Science Daily are of questionable scientific validity, and thus they would also prompt a person of ordinary skill in the art to withhold judgment on the findings until the data became available for evaluation. For example, Dr. Teegarden states that "for the women with calorie intakes of more than 1,900, we found that the calories take over, and any potential benefits of weight-control from calcium are lost." A person of ordinary skill in the art would question this statement, as it is highly unlikely that any change in calcium's effect would occur at an absolute value for caloric intake, without regard for any of the many physiological factors (height, weight, metabolic rate, etc.) that could be expected to cause the effect to vary from person to person. Accordingly, a person of ordinary skill would conclude that Science Daily does not "fairly teach" anything related to the effect of calcium on weight loss, and would wait to review the published data before drawing any conclusions. Similarly, the statements that "women in the study who got their calcium from dairy sources . . . showed more benefits . . . than those who primarily used non-dairy sources" and that "it may suggest that there is something in milk that works to help regulate body

weight" would cause a person of ordinary skill to wonder whether the researchers sufficiently controlled for effects based on other components in milk, and would thus withhold judgment until they were able to evaluate the published data.

For all of the above reasons, a person of ordinary skill at the time Science Daily was published would not have considered it to "fairly teach" anything of value regarding calcium and weight-related benefits, and would have withheld judgment until they had an opportunity to evaluate the peer-reviewed, published data.

Evidence of what a person of ordinary skill would understand from Science Daily is provided in the corresponding peer-reviewed, published study in Lin et al., "Dairy Calcium is Related to Changes in Body Composition During a Two-year Exercise Intervention in Young Women", Journal of the American College of Nutrition, 2000, 19(6), 754-760 (hereinafter "Lin"). A later reference can be used as evidence of how a person of ordinary skill would have viewed an earlier reference, for example to determine whether a statement in an earlier document is inaccurate. See, e.g., In re Brana, 34 USPQ2d 1436, 1441, 1442 n.19 (Fed. Cir. 1995) (using later-filed Declaration to verify the accuracy of a statement in the specification). The Lin reference is persuasive evidence that a person of skill in

the art would conclude that Science Daily did not teach any meaningful connection between calcium and weight-related benefits. A person of ordinary skill in the art would have found that Science Daily reflects no scientific conclusions, just unfounded journalistic interpretations of incomplete and flawed data. Indeed, Lin's data flatly undermine the journalist's purported teachings recited in Science Daily. Furthermore, Lin establishes that Science Daily's purported teachings are, at most, based on associative data without any mechanistic support, and a person of ordinary skill in the art would not infer causation from associative data without some mechanistic rationale to support such a conclusion. And some of the associations reported are so contrary to then-contemporary understanding in the art that the Lin authors themselves describe them as "perplexing." In short, the Lin study results demonstrate that a person of ordinary skill in the art would not have read Science Daily as teaching any relevant link, causative or otherwise, between dietary calcium and weight-related benefits sufficient to motivate a person of ordinary skill to administer calcium with a reasonable expectation that it would cause a metabolic change and lead to weight loss, as claimed. The references do not suggest a cause, a mechanism, or an effect within the scope of the pending claims.



For example, the Lin study actually failed to demonstrate that calcium, and not another component of milk, caused the observed weight benefits. Science Daily states that "women who got their calcium from dairy sources, such as milk, yogurt and cheese, showed more benefits of the weight control measures than did those who primarily used non-dairy sources... or calcium supplements." (Paragraph 12.) In fact, the Lin study found that non-dairy calcium had no effect on body weight, which undermines the conclusion that calcium was the causative agent. See Lin et al., p. 758. Furthermore, because of shortcomings in their study design, the authors were unable to exclude the possibility that the observed weight changes were caused by an ingredient in milk other than calcium. In fact, the authors were forced to conclude that "another component of dairy products which was not analyzed in this study[,]" and not calcium, "could be the factor which influences body weight." *Id.* The authors also state that "[a]nother possibility is that, if total dietary calcium increases, another nutrient decreases," in which case the other nutrient, and not calcium, would be the causative agent. *Id.* These shortcomings may have resulted from the fact that the study was initially intended to evaluate the effects of calcium intake on bone density, not weight. Lin, p.

755. In short, the authors had no basis for the assertion in Science Daily that calcium may curb weight gain in young women.

Furthermore, the authors' attempt to elucidate a mechanistic rationale for their suggested association between calcium intake and weight changes further demonstrates the lack of support for their conclusions. In the Lin article, the authors discuss several calcium intervention studies that explore the role of calcium in adipocyte lipid metabolism to support their hypothesized mechanism for the calcium-weight change association. However, the authors are forced to acknowledge that "[u]nfortunately, the published results of calcium intervention trials in this age group . . . cannot be compared to the results of the current study" because, among other reasons, "changes in weight and body fat may be specific to dairy products, not calcium supplementation alone[.]" Lin, p. 759. In the absence of a demonstration of causation, a person of ordinary skill in the art would not infer causation from associative data without some mechanistic rationale supporting such a conclusion. Accordingly, a person of ordinary skill in the art would not credit Lin's conclusions regarding calcium and weight-related benefits, and thus would lend no credence to similar statements in Science Daily.

The Lin article data also suggested several other associations that depart from prior research and conventional wisdom to such an extent that they call into question the validity of the study as a whole. For example, the study found a positive correlation between vitamin A intake and changes in body weight, which the authors characterize as "perplexing" and inconsistent with other research in the area. Lin, p. 759. In addition, the study also noted a correlation between increased cholesterol intake and weight loss. They offer no explanation for this extremely counterintuitive result, other than to note that the result is "perplexing" and that "further investigation is warranted."

In summary, a careful analysis of the published study based on the same data that formed the basis for the Science Daily article compels the following conclusions: 1) the authors focus on an alleged association between increased calcium intake and weight changes, but the data supporting the association is speculative at best and some of the data actually refutes their conclusion; 2) the authors themselves acknowledge that they failed to exclude the possibility that a nutrient other than calcium was the causative agent, to the point that they acknowledge they do not have a basis for comparing their study to calcium intervention studies; 3) their data supported other,

more "perplexing" associations between nutrients and weight loss that depart from previous research and conventional wisdom to such an extent that they call into question the validity of the study as a whole. Thus, Science Daily does not teach a person of ordinary skill that calcium may curb weight gain in young women. Accordingly, Science Daily does not disclose or suggest the claimed methods.

Indeed, far from being obvious over the study discussed in Science Daily, the discoveries that gave rise to the claims at issue constitute unexpected results. The scientific literature is filled with associative data indicating that many nutrients are directly or inversely associated with obesity. As noted above, persons skilled in the relevant art (a) do not infer causality from associative studies, and (b) would always look for an alternative explanation unless a plausible mechanism were presented to accompany the associative study. Indeed, a person of skill in the art, after evaluating the conclusions in the Science Daily study as well as the asserted bases for those conclusions, would likely decide that the conclusions are off-base, and would instead pursue other possible explanations for the observed weight loss.

The Examiner cites the Summerbell article as evidence that the use of calcium to cause weight loss in the obese is obvious.

The Examiner notes the fact that the stated purpose of the Summerbell article is to test the hypothesis that lack of compliance is the source of most diet failures and that novelty encourages compliance. Summerbell found a group of subject who had not used a milk only diet and divided them into 3 groups: one using a milk only diet, a second using a diet of a milk plus one other food, and a third using a control diet consisting of a conventional balanced diet. Summerbell found that the milk only group lost the most weight. Summerbell concluded that this was due to greater compliance with the diet. Summerbell also noted that the milk only diet provided an energy deficit of 7 MJ (or 1671 kcal) per day, as opposed to the milk plus diet, which provided a deficit of 4 MJ (or 955 kcal) per day. Clearly, if both groups comply equally, the milk only group should lose more weight because they have the greatest deficit. By comparison, the Science Daily article, and the Lin article it reports, required no energy deficit for either the variable or the control groups. Thus based upon the Summerbell article, one could not determine if the weight loss is due to milk, compliance, or energy deficit. This is clearly a reason for a person skilled in the art to question the meaning of Summerbell, and thus teaches away from the conclusion that Summerbell supports the use of calcium to lose weight.

Summerbell concluded that the cause of the weight loss was greater compliance. Summerbell then stated "[w]e are not advocating milk only as a general long term reducing diet for obese outpatients..." By comparison, the Science Daily article reports study results obtained over a two-year period. These statements would compel a person skilled in the art to conclude that the purported teachings of the Science Daily article and the Summerbell article are in conflict, and thus a person of ordinary skill in the art would not combine the references. And in any event, a person of ordinary skill in the art would discount the purported teachings of Science Daily regarding calcium and weight-related benefits for the reasons presented above, and thus would see no reason to combine Summerbell and Science Daily. Accordingly, for this reason as well, a person of ordinary skill would not combine the references to arrive at the claimed methods.

Furthermore, Summerbell does not even mention the term "calcium". Summerbell choose the milk only diet because none of the subjects had previously tried a milk only diet. Milk is a complex substance that contains carbohydrates, fats and protein, as well as calcium and other chemicals. Summerbell does not select a portion of milk to highlight, except the energy deficit caused by the milk only diet. A person skilled in the art would

understand that milk is this complex substance, and would not assume that calcium, rather than calorie content, is the weight loss agent of milk. Thus Summerbell again teaches away from the claimed methods.

In addition, persons skilled in the art would have interpreted the Summerbell article as an article about behavior. An article by Heymsfield suggests that Summerbell is viewed as a behavior article. *Weight Management Using Meal Replacement Strategy: Meta and Pooling Analysis from Six Studies*, International Journal of Obesity (2003), 27, 537-549, Table 7 (attached hereto as Appendix A). Summerbell is considered a meal-replacement diet by Heymsfield (Heymsfield, p. 539 and Table 7 - Summerbell among 30 papers that met criteria for meal replacement studies), and Heymsfield states that meal replacement diets, like all low-calorie diets, involve "behavior modification." Heymsfield, p. 538. Thus, the Summerbell article was understood by persons skilled in the art as a study about behavior, rather than about food chemistry. Any suggestion that a person skilled in the art would interpret the Summerbell study as a study of food chemistry is engaging in impermissible hindsight reasoning. The reading of Summerbell presented in the Office Action is only possible in light of the work of the present inventor Zemel. Thus the claimed methods are

not disclosed or suggested by the cited Summerbell reference, even in combination with the Science Daily reference.

In the Office Action at page 14, claims 31 and 33-37 are rejected as allegedly being unpatentable under 35 USC 103(a) based on the Science Daily article, Summerbell and the Dietary Supplement Fact Sheet. Applicant disagrees. The Dietary Supplement Fact Sheet lists non-dairy sources of calcium, but does not provide any reason that would cause a person skilled in the art to believe that calcium will cause weight loss, increase metabolism, or effect adipose tissue.

In the Office Action at page 15, claim 72 is rejected as allegedly being unpatentable under 35 USC 103(a) based on the Science Daily article, Summerbell and McCarty (US Patent Number 5914326). Applicants disagree. McCarty describes a supplement regime that is intended to cause weight loss. McCarty does not claim that calcium will cause weight loss. McCarty thus does not cure the defects in the Science Daily article or Summerbell.

The Applicant respectfully requests, if the claims are again rejected upon any combination of references, that the Examiner include an explanation, in accordance with M.P.E.P. § 706.02, Ex parte Clapp, 27 U.S.P.Q. 972 (POBA 1985) and Ex parte Levensgood, 28 U.S.P.Q.2d 1300 (PTOBA&I 1993). a "factual basis



to support his conclusion that it would have been obvious" to make the combination.

### **Double Patenting**

In the Office Action at page 18, claims 1, 5-6, 27-37, 41-44, 46-53, 55, 57, 59-62, and 64-72 are rejected on the grounds of non-statutory obviousness-type double patenting over claims 1-7, and 10-15 of copending U.S. Appl. No. 10/827296. The copending application has been abandoned and that will obviate the Double Patenting rejection.

In the Office Action at page 19, claims 1, 5-6, 27-37, 41-44, 46-53, 55, 57, 59-62, and 64-72 are rejected on the grounds of non-statutory obviousness-type double patenting over claims 1-7, 10-17, and 19-22 of copending U.S. Appl. No. 10/827307. The copending application has been abandoned and that will obviate the Double Patenting rejection.

In the Office Action at page 21, claims 1, 5-6, 27-37, 41-44, 46-53, 55, 57, 59-62, and 64-72 are rejected on the grounds of non-statutory obviousness-type double patenting over claims 21, 23-24, 35-38, 41, 50, 55-58, 61-63, and 78-79 of copending U.S. Appl. No. 10/017568. The Applicant has included a terminal disclaimer that will obviate the Double Patenting rejection.

### **Conclusion**

For at least the above reasons, the Applicant submits that the specification and claims are now in proper form, and that the claims are patentable over the prior art. Therefore Applicant submits that this application is now in condition for allowance, which action is respectfully solicited.

### **Conditional Request For Constructive Assistance**

The Applicant has amended the claims of this application so that they are proper, definite and define novel and nonobvious structure. If, for any reason this application is not believed to be in full condition for allowance, the Applicant respectfully request the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P § 2173.02 and § 707.07(j) in

order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings.

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Respectfully submitted,

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